

CLAIMS

I claim:

1. A direct-response pressure-operated regulating valve including, a housing and flexible diaphragm means in the housing dividing the interior volume into a control pressure chamber and an outlet chamber, a valve seat which is connectable with a fluid conduit containing pressurized fluid, and a valve closing means attached to the diaphragm means to cooperate with the valve seat to control communication between the valve seat and the outlet chamber, whereby pressurized control fluid admitted into the control pressure chamber causes movement of the diaphragm means thereby controlling pressure in the fluid conduit, the improvement comprises; an adjustment means for moving the valve seat relative to the housing so that the valve seat is movable perpendicular to the diaphragm means whereby the effective area of the diaphragm means is selectively variable.
2. The apparatus of claim 1 wherein the valve closing means comprises a poppet, a resilient sealing means which cooperates with the valve seat and which is fastened to the poppet, and a diaphragm follower which is fastened to the diaphragm means.
3. The apparatus of claim 2 wherein the diaphragm follower and the resilient sealing means are substantially parallel and coaxial.
4. The apparatus of claim 2 wherein the resilient sealing means is an o-ring of predetermined size, and the diaphragm follower is a disc of predetermined diameter.
5. The apparatus of claim 1 wherein the adjustment means is a screw thread.
6. The apparatus of claim 5 wherein leakage from the screw thread is discouraged by a thread sealing means.

7. The apparatus of claim 1 wherein the effective area of the valve-closing means is very much larger than the lift of the valve closing means during operation of the valve.
8. The apparatus of claim 1 wherein the area of the valve-closing means which is acted upon by fluid pressure contained in the fluid conduit is substantially equal to the effective area of the diaphragm means.
9. A method for adjusting the effective area of a direct-response type pressure-operated regulating valve, the method employing a direct-response pressure-operated valve including, a housing and flexible diaphragm means in the housing dividing the interior volume thereof into a control pressure chamber and an outlet chamber, a valve seat in communication with a pressurized fluid conduit, and a valve-closing member attached to the diaphragm means to cooperate with the valve seat to control communication between the fluid conduit and the outlet chamber, whereby pressurized control fluid admitted into the control pressure chamber causes movement of the diaphragm means thereby controlling pressure in the fluid conduit, the improvement comprises;
moving the valve seat perpendicular to the diaphragm means so that the effective area of the diaphragm means is selectively varied.
10. The method of claim 9 wherein the method further comprises adjusting the valve seat so that the forces opening and closing the valve-closing member are substantially equal when the valve just closes.
11. A direct-response pressure-operated regulating valve comprising;
a control chamber housing, an outlet chamber housing and flexible diaphragm means dividing the housings into a control pressure chamber and an outlet chamber,
a valve seat which is connectable with a fluid conduit containing pressurized fluid,
a valve closing means attached to the diaphragm means to cooperate with the valve

seat to control communication between the valve seat and the outlet chamber, whereby pressurized control fluid admitted into the control pressure chamber causes movement of the diaphragm means thereby controlling pressure in the fluid conduit, and an adjustment means for moving the valve seat relative to the housing so that the valve seat is movable perpendicular to the diaphragm means whereby the effective area of the diaphragm means is selectively variable.

12. The apparatus of claim 11 wherein the valve closing means comprises a poppet, a resilient sealing means which cooperates with the valve seat and which is fastened to the poppet, and a diaphragm follower which is fastened to the diaphragm means.

13. The apparatus of claim 12 wherein the diaphragm follower and the resilient sealing means are substantially parallel and coaxial.

14. The apparatus of claim 12 wherein the resilient sealing means is an o-ring of predetermined size, and the diaphragm follower is a disc of predetermined diameter.

15. The apparatus of claim 11 wherein the adjustment means is a screw thread.

16. The apparatus of claim 15 wherein leakage from the screw thread is discouraged by a thread sealing means.

17. The apparatus of claim 11 wherein the effective area of the valve-closing means is very much larger than the lift of the valve closing means during operation of the valve.

18. The apparatus of claim 11 wherein the area of the valve-closing means which is acted upon by fluid pressure contained in the fluid conduit is substantially equal to the effective area of the diaphragm means.